

AVIATION WEEK

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NOV. 22, 1948

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NEWS SIDELIGHTS

Air Parcel Post

Post Office estimates indicate that the October air parcel post volume will show only slight, if any, increase over the September volume, which fell far short of expectations and was explained away as due to general lack of knowledge of the new service. The Department anticipates a total air business volume of \$4,993,800 for October, an increase of 670,895 lbs over the September volume.

Using the Department's estimate that about 70 percent of increased air business is parcel post, the total volume in October is parcel post volume of 469,626 lbs.

In September, air business increased 468,949 lbs over August, indicating an air parcel post volume of 447,864 lbs. The total air business volume anticipated for October will top the October 1945 volume of 7,870,890 lbs about 2,000,000 lbs.

New Sea-Air Boss

Tilly Ford is out as chairman of the Sea-Air Committee. Ford left Washington for his home state, California, in a manner, and is not expected to return.

His probable successor is Wallace W. Hickey, Robert Hickey, Jr., who has been handling the committee's business. Hickey chaired the two bills it passed in the new Congress, a group representing companies air rights and the other raising operation of aircraft and utility and payments to its owners. Hickey recently served as counsel to the Old House Civil Affairs Committee during its investigation of wartime transportation.

New CAB Fan

Civil Aeronautics Board last week removed its first put on the back from Miles' COF. Sen. Owen Brewster, one of the CAB's severest critics over the past five years.

Brewster had an "anti-traded" press conference he was "well-motivated" by the "new approach" of the CAB and the administration in working out an economic domestic and foreign air system. As examples of the "new approach" Brewster pointed to: (1) CAB's recognition to determine whether National Air Lines should be divided and its routes distributed to Eastern Air Lines, Delta Air Lines, and Pan American Airways; and (2) the Pacific

Procurement Sloop?

Aircraft manufacturers better prepare for a severe shock if price cut plans for the National Military Establishment fiscal 1950 budget are not changed before submission to the President and Congress. As the total \$15,000,000,000 military budget now stands the U. S. Air Force size would be so small that only 75 combat groups could be reported instead of the 70 groups currently ordered by the last session of Congress. To maintain this could mean a 30 percent slash in next year's procurement funds.

Northwest Hason declines under which PAA as well as Northwest Airlines, received a certificate.

Congress has been shaking over the last short session, and proposed the above-mentioned policy, should apply an action placing two owners on the Northwest-Hason route, which was not support even one carrier. The Board originally wanted the route to Northwest. Later a Presidential order certified PAA to handle through-traffic to the Orient over the route.

Shift to Convoy?

The new Congress has been passed previously on the company's Sea-Dirigo pilot buildings when they are seen by the public. The company also has been used in its own government, supervised over the still-affected name of Consolidated United Aircraft Corp.

Top company officials say they need the full corporate name in on mobile and hope to negotiate Congress. They deny that legal steps will be taken to change the name.

Johnson for Delmar?

Former assistant Secretary of War Louis Johnson, at the Washington law firm, Shapiro and Johnson, is now most frequently mentioned as successor to Secretary of Defense James Forrestal. Johnson headed the subcommittee that shipped out contributions to finance the Truman campaign. Forrestal was in Berlin last week, he had talked the President he would return before the end of the new administration's

four-year term. Observers expect his resignation will be "accepted" in some form this fall.

All cabinet officers on taking office submit resignations to the President for acceptance at his will. Assistant Chief would welcome appointment of Johnson, a former advisor of an aviator, and also the quick exit of Forrestal.

Another leading contender for the top defense post is Truman's good friend Gen. H. H. Arnold of Washington who was defeated for reelection. Wallace was chairman of the aviation subcommittee of the War Investigating Committee headed by Truman when he was a Senator.

Northrop Mile

Jack Northrop admitted to phoning guided missiles among other relations, not within two years in his reading Library of Congress speech. He should know. It is his missile that will do the job.

The Northrop missile, as well as several others, represents the dramatic revival of Air Force missile philosophy, which has received a long way from the "missile rocket" missile mentioned in the months following V-J Day. The "new look" in Air Force missile is hardly distinguishable from the new new look in military air fighter: turbojet power, swept wings, a healthy head turn and a "conservative" 600 mph. It is a low-speed, low-altitude missile, but 500 mph and less than 10,000 ft. of TNT when it hits its target. Northrop's air missile the "guided missile" in several steps up from the wartime V-J will soon learn that as far as the USAF is concerned, the "guided missile" is just a low-speed fighter with the pilot removed.

Air Reserve Shakeup

Secretary of War Gen. H. H. Arnold (Pete) Oswald from the Tactical Air Command to head the U. S. Air Force reserve program will issue a thorough shake-up of the national reserve training system. Air Force officials have been shocked by the record of reservists who come through the Military Air Transport School at Great Falls, Montana, preparatory to active duty on the Berlin shift.

The total cost of over 50 reservists has been paid in cost through AATP training program during the last that all of them eventually lost in their piloting proficiency to reserve flying.

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DOMESTIC

Air fought opinions on the North Atlantic before the East Coast long-abandoned strike will create increased demand for air freight across the Europe of the strike countries. Last week was too early for much new business to develop. But with hardly a dime placed against exclusively in Atlantic freight systems, operators do not think they can handle the risk of business expected.

Dr. Karl T. Compton, president of Massachusetts Institute of Technology, was sworn in as member of the National Advisory Committee for Aeronautics. An new head of Research and Development Board, he automatically became member of NACA, succeeding Dr. Vannevar Bush, former KDB chief.

Wright Brothers original plane, on its way back to the U. S. from Great Britain, picked up critics aboard the Grand Inland. Inexpensive, but to be sure inclined to Hufsch, because of long absence of the New York harbor. Navy carrier last week, was scheduled to pick up plane at Hufsch, take it to New York where a Navy truck would haul it to Washington.

Norman Larson, Burbank, Calif., Bendix distributor, last week was elected president of National Aviation Trades Association, according Beverly Howard, Charlotte, N. C.

FINANCIAL

Continental Corp. reported net profit for three months ended Sept. 30 of \$502,864, after taxes, on sales of \$24,121,701. For the same period, Wright Aeronautical sales were \$11,541,232, on which loss of \$16,575 was taken. Consolidated C-W profit for same months was \$7,244,203, after taxes, on sales of \$71,618,088. Sept. 30 holding was \$114,100,000, compared to \$846,000,000 June 30.

FOREIGN

Alfred de los Rios, former Lockheed Aerospace Corp. expert manager and pioneer of auto-American lightplane build, was killed when his Cessna Cadet crashed on a forced landing in a river in the interior of Bolivia. Accident occurred Sept. 25, but at such a remote spot that he U. S. friends were advised only recently. Here have leaving break observed the landing field is now trying to find. After circling a while, he attempted a water landing after dark and the plane struck rocks in a shallow stream, killing him instantly.

INDUSTRY OBSERVER

McDonnell's XP-87 piston fighter is still playing "catch-the-bug" with the specially signed Boeing B-29 at Miami. Numerous successful aerial recoveries have been made by McDonnell test pilot Earl Schuch on the B-29 extended inspection since his difficulties on the first test flight last Aug. 25. However Schuch came in too fast to recover smoothly and lost out the engaging hook from the XP-87 nose as the hook hit the trapeze. Schuch again made a belly landing as the emergency slid at better than 170 mph. He ploughed up the desert for 1400 ft. but again escaped without injury.

McDonnell's XP-88, long range piston-powered piston fighter, is progressing rapidly through Phase I flight tests at Miami. Only trouble encountered so far has been burned out brakes in a result of high speed testing. Speed tests are changing close to superlative performance at altitude.

Manufacturers are watching the Atlantic Defense Pact conference now under way in Europe between Defense Secretary, President, Secretary of State Marshall and Western European leaders. If the United States is committed to meeting Western Europe manufacturers anticipated a swiftly increasing demand for jet fighter types. Western European nations want the latest type jet fighters to defend their cities against possible enemy aerial attacks. Britain, which has had a virtual monopoly on jet fighter exports to Europe, may not be able to meet expanded requirements, thus putting in additional hands on American orders of jet fighters.

Boeing of the Curtiss-Wright C-46 transports recently recalled by U. S. Air Force from War Assets Administration will be used for reserve training. About 100 C-46s are scheduled for reserve operations.

Boeing Radio division at Baltimore awarded a \$2,800,000 contract from the Navy to build 12 new GCA systems. All Navy GCA units are available to civilian pilots in emergency or for indoctrination in GCA procedures.

Naval Air Training Command, headed by Rear Admiral J. W. Brown, Jr., recently completed 150,000 hr. of flying without a fatal accident. This includes all Naval Reserve flying and compares with a wartime training accident rate of 8.5 fatalities per 150,000 hr. of flying.

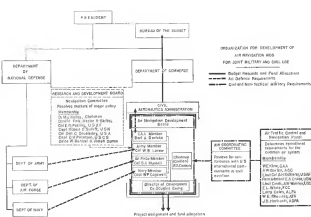
Westland Aircraft, Ltd., will get additional orders for its Wyvern Navy fighter. The 12 Rolls Royce Eagle-powered version, one with an Armstrong-Siddley Python and the other with a Rolls Royce Clyde.

CAA will switch to an elliptical holding pattern for all traffic control holding fees effective next Feb. 1. The new standard holding pattern will consist of a two minute straight leg with a standard rate 180 degree turn at both ends.

Cessna's XC-95, giant transport counterpart of the B-36, has had its single wheel landing gear replaced by a double tandem design similar to that now used on the B-36A. Cessna has also covered the huge transport with skid-landing gear as a protection against salt air corrosion.

California Ross of Los Angeles is expected to make the first flight demonstrations of their automatic Ground Control Approach system (GCA) late this month for the benefit of U. S. Air Force and Royal Canadian Air Force observers. In the automatic GCA, moving planes are tracked by search radar and then landed by auto control linked to the plane's autopilot. If prototype tests are successful California expects to go into production on a military contract early next year.

Fairchild Aircraft Co. of Canada, Ltd., has been awarded at London, England, to build equipment of the parent company in Canada and to service Fairchild aircraft used in the Royal Canadian Navy. Company is capitalized at \$1,000,000 and has purchased the former Clark Ross aircraft factory near Halifax, N. S. from the Canadian War Assets Corporation.



All-Weather Airways Organization

Three inter-locking groups of complex administrative structure look after interests of five federal agencies.

By Robert Hoan

The organizational framework of the program is complex even for government. It involves five federal department units and three specially created interdepartmental groups. Basically the program will work like this:

• **Key Groups**—Navigation panel of the Air Commanding Committee will determine the operational requirements of the proposed airways system for peacetime use at both military and civilian airports. Navigation Committee of the Research and Development Board will determine additional system needs of the Air Force, Navy and Army for tactical military operations. Air Navigation Development Board will take both sets of requirements into account.

agents from ACC and RIMS and directed research and development programs to produce the necessary equipment.

When NDM panels on a piece of equipment are suitable for use in the weapons system it will be purchased in quantity by Air Force, Navy and Coast Guard Administrative Administrations for installation on their portions of the weapons and operated as part of a common, integrated system. Thus, while all its products for research and development under the program will be controlled by ANDR, all large scale buying of weapons equipment will continue to be done by CAA USAF and Navy with additional airborne equipment purchased by the commercial airlines and individual users of the newest military aircraft.

• **ACC Nav Panel**—An Navigation and Traffic Control Panel (Nav Panel) of the Air Coordinating Committee is headed by W. E. Khan of CAA, now head of the federal aviation system.

Other members: A. W. Barton, AGC, smelter; Lieut. Col. A. H. Kallberg, USAF, Rear Admiral E. A. Chase, Navy, Lieut. Gen. A. W. Womley, Coast Guard and E. L. White, Federal Communications Commission. These are the voting members of the Star Panel. Nonvoting members are Larry Cahn, an Air Photo Association, W. F. Rhoades, Air Transport Association, and J. B. Harbath, Aerial Owners and Photo Association.

Working group of the ACC. NRP Panel consists of Charles Merrill and Julia Fisher, both of CAN; Janet Col Kibben, Cando; Edward M. Morgan, Nave; and Janet Cando Winkler, Donald. Mitchell of FGC and J. W. Lewis of the Air Transport Association.

►RIDE Gains—The November 1995

member of the RDR is headed by Dr M. J. Kafa, executive vice president of the Bell Telephone Laboratories. Other members include Hector R. Shifter, president of Aerospace Instruments Laboratory, Donald Fink, editor of Electronics magazine; Col. E. R. Peterson, Coast Guard; Capt. Robert Swafford, Navy; Col. Donald C. Doolittle, USAF; Capt. C. H. Peterson, Coast Guard; Dallas W. Renshaw, CAA administrator; and Ralph Dineen, president of Amer-

our Archives. Associate members of this committee who have no positive vote last year submit disunity. Latent Col. R. D. Harte, Corps of Engineers, Detroit; C. Stuller, Army Transportation Corps, Latent Col. W. R. Lutz, Marine Corps, and Nit. Besserman, USAF Wright Field. Disunity are retained in the ADR for dual action.

The sub Navigation and Development Board is headed by Ralph Dunne serving as permanent chairman on a part-time basis. Full-time members include Bert A. Denzle, CAA, Col. Walter L. Luce, Army, Col. Sam Mordell, USAF, and Capt. W. P. Cagnawell. Navy Dunne was appointed by the Secretary of Commerce with the approval of the Secretary of Defense. Other ANDR members are appointed by the heads of their respective agencies.

► **Top Technical Man**—Top technical man in ANDS is Dr. Douglas Ewing, formerly of the Radio Corp. of America, who is now ANDS's director of development. Ewing will head a five-man staff of electronic engineers who will be responsible for organizing and coordinating the research and development program for the new sensory system along the lines laid down by ANDS.

Correspondence for the Air Navigation Development Board should be addressed to its executive secretary at room 7136, Commerce Dept. Building Box 34, D. C.

Presumably it is to develop a process of review which can be used equally well by civilian and military places during peacetime, plan special military equipment that can be superimposed on the civilian one, enhance use both by non tactical transport operations and by tactical military operations. Research and Development Board will be responsible for development of the path, tactical navigation and identification equipment as well as the coordination of land, sea and air navigation progress within the National Military Establishment.

• **Avoid duplication:** This division between the core and edge routers and the placement of search index for traffic control in the core routers and the development of an early warning index network for air defense countries. Forces would be handled by ACC, New Panel and ANDE while the latter would be in RUMS function coordinated with ANDE so that the two index networks would not duplicate each other and could be used together for identification of friendly or hostile and detection of cross-border aircraft.

The common system program has been divided into two phases—an interim release that will be primarily an repetition and extension of the



Ralph Deneen



De Douglas Enslin

present CVA program or obtaining desired monitoring equipment. HRS indicates that a target system that will be based primarily on radar and will require development of considerable new equipment. Bulk of the \$80,000,000 allocated in ANMIR's research budget squandership for the next eight years will be devoted to equipment for the target system. Cost of production and installation of both systems is estimated at \$1,115,000,000 spread out over the next 15 years. The RFEA report is the Special Committee's 51st Interim

WETA, March 1) is serving as the basic technical blueprint for the proposed system, subject to continued modification by all three groups. Now, heading the program, RTCA will continue to function as technical consultants on specific technical problems connected with the system.

Group to Develop L-5 Export Market

Establishment of a new, international sales organization to market L-9 Serial laser-type amplifiers and their components in South America and

other foreign markets has been announced by Ralph T. D. Munn, president of Sentinel Trade Inc., Ann Arbor, Mich. The new marketing organization designated as Sentinel International Division Inc., Dupont Circle Building, Washington, will be headed by Frank H. Borsche, president and treasurer.

Other officers: Meetings and Samuel S. Focht, vice presidents; Robert T. Hoffman Jr., secretary and Charles M. Wolfes, general counsel.

• **Strain Type**—The engine, powered with a 150-hp. Lycoming engine, was developed by Strain Systems Corp.

dated Vultee Aircraft Corp. Approximately 5700 of the type, with various modifications, were manufactured in southern rice by the AAF and the ACP. After being declared surplus for a three-week period at war end, the airplanes again were put in active status by the ACP and a new widely used for liaison and. Approximately 150 of the planes were sold during the brief surplus period by War Assets Administration. About 250 others were sold in India, and another 150 in China were turned over to the Chinese government.

Mytanga said that his organization began operations in November, 1945 under letters of a foundation from Vienna, and that in July, 1948, were fighting rights for the airplane were transferred to his company as a non-exclusive non-assignable lease, with rights to revert to Conquest in the event his company disposed of them.

Sentinel currently is selling replacement parts to the AGP at a rate of approximately \$750,000 a year. Most of the original surplus stock of L-5 part and planes in process of completion is now depleted and the Sentinel organization is operating a small plant with approximately 100 employees to make additional parts.

• **Complete Flares**—While the company thus far has only produced components it is preparing to undertake production of complete L-5 straphers with the first expected to be completed around Jan. 1. It is planned to market the flares for industrial uses, including aerial mapping and survey personnel delivery, cargo handling, ambulances, wrecks, mine line, forestry, signal etc.

Montage and Sestini also were showing a modification of the L-3 design with a redesigned wing which is expected to improve the airplane by reducing its landing speed to around 17 mph. At present, landing speed

40 mph. The new modification would make use of the early V-70 fuselage design, a predecessor of the F-15, which was never produced in quantity. Army Field Forces has indicated an interest in the modified design, he said. In addition to the plans being used by the U.S. military services, there are hundreds of other F-15s being used by military forces of friendly nations, while the international defense agencies to which with recovery spare parts as they are needed.

Price of the F-15 will range upward from \$10,000 for the basic model, depending upon special equipment needed for various operations.

Stinson Voyager to Piper?

Piper Aircraft Corp., Lock Haven, Pa., has taken over the manufacturing rights to the Stinson Voyager 165 four-place, plus a 1700-hp, six-cylinder, turbocharged engine. The aircraft will be made with Consolidated Vultee Aircraft Corp., according to widespread reports, but not at the ADMA-NATA production location.

Company officials have indicated for some time that they would like to dispose of the Stinson division and concentrate activities on larger military aircraft and transports. The former Stinson plant at Wyome, Mich., has been closed for several months and Stinson activities have been moved to Consolidated Vultee headquarters at San Diego.



NEW F-4 FIGHTER
First flight photo of Chance Vought's radically changed Navy jet fighter, the F-4U-1, taken during test flights at the Navy's test center, Patuxent River, Md. The single-engine fighter is powered by

How to Sell

300 delegates to joint ADMA-NATA meeting hear eight sales tips.

CLEVELAND—An eight-point aviation selling program for 1969 presented by The J. P. Jones, Glidden Co. president, Cleveland, launched the gathering of nearly 300 representatives of various commercial interests including aircraft service agencies, dealers, distributors and manufacturers, at the combined conventions of the American Distribution and Manufacturers Assn. and the National Aviation Trades Assn. here.

The meeting was noteworthy for its analysis of the sales situation. It was a candid display with more 25 evaluation of aviation equipment and accessories. As attendees were invited to examine people that it was to succeed it was the best introduction to a larger and more elaborate trade show next year which may include other exhibitors.

Sales Talk—The Joyce talk, based on the speaker's experience as a business plane pilot and as a manufacturing executive, outlined three points as important in 1969 aviation sales:

- Cooperation within the industry and elimination of much of the dog-eat-dog price cutting tactics which have been too frequent in the past.

- Knowledge of the products sold.
- Personal selling including accurate performance figures.
- Selling the pleasure of flying more emphatically with less suggestion of utility features.
- Making it pleasant to fly, by better outdoor relations at airports.
- More lounge space at airports.

As an aggressive campaign to fight the first complex, among light aircraft producers and their buyers and retailers by "positive statements of accident causation."

• Leadership in selling based on the profitable foundation of the coefficient long range prospects of the personal and business aviation.

Costs—Flight—Found here operations, working under leadership of NATA President Beverly Howard, Chaffeeville, S. C., pledged money to participate in a court fight starting in the District of Columbia Federal Court against the Veterans' Administration to have VA Administrator Carl Gray's instruction No. 1 on the flight training program declared illegal.

Push Air—Push Air is pushing further the development of the NATA program as a new network to supply plane service from other members to offer more salesmen discussed. A new director will have less than 300 local operators who will only offer service in 15 states will be ready for distribution soon.

Speaking at the ADMA's meeting, Lawrence Zigant, Detroit, president of General Aircraft Supply Corp., called for a mid-point of the aviation industry on a strong practical footing. Having his recommendations as a poll of distributor members, he called for flexible business operations, planned to achieve to competitors for a plan in 1969, 10 percent reduction. Additional new service outlets for competitors should be sought.

Japanese Methods—George R. Galt, president in charge of sales, Van Dusen Aircraft Services, Inc., Minneapolis told the ADMA group that good automobile service stations with courteous attendants did not come along until the depression of the 1930s made extra selling efforts necessary. He predicted an improvement in new changing methods in commercial aviation based on the same type of customer service as in the next few years.

Behrke Re-elected

Daniel I. Behrke was re-elected without opposition to his third two-year term as president of the Air Line Pilot Association at the conclusion of the union's tenth convention last week. J. E. Wood, Eastern Air Lines, was elected first vice president, F. A. Spencer, American Airlines, was named secretary, and R. G. Stent, TWA, became treasurer.

PRODUCTION

Export Effort

Producers can handle higher foreign demand, AIA survey discloses.

American aircraft manufacturers still have plenty of idle productive capacity to handle substantially increased export business, according to Maj. Gen. Oliver F. Lehto, president of the Aircraft Industries Association.

Citing an AIA survey of 22 aircraft, engine, and aircraft manufacturers, Lehto said that 21 of these firms were planning to increase their export as fully or maintain it at present rates while only one planned substantial export sales reduction. Increasing export sales efforts included first adding manufacturers of military and transport planes, four personal plane builders, one engine manufacturer and one each of the largest U.S. instrument and avionics manufacturers.

Exports Discounted—Lehto discounted reports which have been circulating about that American manufacturers are tied up by the expanded military manufacturing program and are unable to handle export orders.

"Actually there are numerous American manufacturers still in need of business," Lehto said. "They have a large amount of idle capacity available for production of personal planes, transport and helicopter, the types in demand by foreign nations."

Both Republic Aviation and Lockheed Aircraft Corp. told Aviation Week, early in November that they were making reports of their F-4 and F-100 jet fighters to South American buyers of increased production without delay on U.S. Air Force orders already in the file. Release of those two fighters for export to Latin America (Aviation Week Nov. 1) is expected to generate a large volume of military export business but not hinder by the industry as a sign of increasing reliance on the government, said State Department officials regarding military plane exports.

Look for Increased—Aircraft manufacturers before an influx volume of military export business would have to handle under a limited type of program due to the severe shortage of dollars abroad. They are watching the North Atlantic Debt Free conference in Europe for signs of a new loan-approval program emerging for Western Europe. Such a program would require approval from the U.S. Congress and

would be topped off well in advance by provisions of enabling legislation in Congress.

As peace officials point out that they have demanded for military aircraft, a foreign and progress would have to be met out of current production with the possible exception of those which were obsolete planes would be adequate. Western European nations will demand the latest type jet fighters to defend their cities against possible air attacks, USAF officials believe. They also admit that many of the F-47 and F-104 that have been considered in storage are showing serious evidence of deterioration which they are scrapped for active service.

Exports Shown—AIA reported that the export of war surplus types had slowed to a trickle and that both at current export rates and up of transport and personal planes with Europe gathering most of the transport and South America the majority of personal planes. Aircraft exports were running at about a \$100,000,000 in 1968 compared with \$174,000,000 in 1949.

All aircraft and parts could be located for export by the American division of the State Department. Military aircraft exports also improve approval by USAF to assure that they will not interfere with production schedules of



Baumann Brigadier in CAA Tests

Plans are being pushed for production of the Baumann Brigadier, two-engine executive transport.

Jack Baumann, designer, and president of Baumann Aircraft Corp., will become manufacturer of the plane to be built under a licensed type of program due to the severe shortage of dollars abroad. They are watching the North Atlantic Debt Free conference in Europe for signs of a new loan-approval program emerging for Western Europe. Such a program would require approval from the U.S. Congress and

The five-place B-210 is a design built for low operating costs, low wing loading and high lift. It is also a CAA certification testing

the aircraft. At present engine output of jet fighters requires an agreement that the planes will not be held by the industry buying them.

Health Hazards

Safety Congress hears expert discuss aspects of plant dangers.

Aircraft manufacturing is one of the most of all occupations (Aviation Week, Oct. 18), but some improvement can be made.

A health expert spotlighted the industry's safety work points (as well as strong points) at the annual National Safety Congress of the National Safety Council in Chicago. Merrill Eisenbach, chief of the health and safety branch, U.S. Atomic Energy Commission, pointed out that although the industry has an "unparalleled standard of general plant hygiene, there are a number of potential health hazards" for which adequate safeguards must be provided.

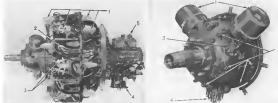
Four Groups—Eisenbach divided the health hazards into four groups, relating specifically to engine, airframe, and propeller manufacturing, and general hazards.

Manufacturing into engine manufacturing "declared levels of atmospheric dusts and vapors" as one of the major hazards. Eisenbach stressed

the manufacturer believes it will be possible to meet the plane at less than \$75,000 due to low development costs, design simplicity and tooling economies.

Often are not being taken yet, but Baumann says it has engineers from major foreign countries, in addition to prospects for domestic business.

The Brigadier is powered by two 145-hp Continental engines driving pusher propellers and has shown a cruising speed which indicates better than 250 mph.



Design Details of the R-2180 . . .

Side view 1. Front and side view line arrangement; 2. shroud for exhaust pipes; 3. low friction piston rods; 4. exhaust valve lift

thrust body, with integral fuel pump; and 5. detachable accessory gear box. Note section (right) 1. Magnets; 2. pressure for monitoring wear sensors; 3. connections for intake pressure indicators; and 4. external of coverage pump.



Valve overlap mechanism (left) 4. "flared" gear 2, hydraulic pistons, 3. thrust; 4. cam, 5. and advance valve; 6. piston, and 7. drive gear coupled to crankshaft. At right: 1. Flat crankshaft design and 2. cylinder hold-down bolts extending through case



Crankcase (left) 1. Cylinder casing for the diaphragm; 2. light access struts; and 3. integral case of cover. Right: 1. Magnet and ground; 2. diaphragm between Morse and air case; 3. pins, removable for controls, etc.; and 4. vibration isolation

Latest Piston Powerplant: R-2180

P&W's new engine, intended for DC-4, C-54 conversion, designed to improve speed, range, and takeoff performance.

By Irving Stone

Though emphasis on turbojet and compound engine development, but to some extent, toward the piston engine with a shade of abandonment, engineers concerned with the conventional power plant are not content to accept as final the excellent performance it has slowly shown. These engines are not resting on their laurels.

For specific applications—in existing aircraft, and in proposed planes as well—refinement of the reciprocating engine involves worthwhile improvements in operating economy, and efficiency in both cargo carriers and transports.

And now, large helicopter design offers a new field for low-cost, piston engine power.

■ **New Engines**—Latest of these piston developments to go into production is Pratt & Whitney's Model R, 1650-hp., 14-cylinder, R-2180 Two-Way, with single speed supercharger drive.

Recently given its airworthiness certificate, first production models are scheduled for early '49.

Designed for conversion of C-54 and DC-4 aircraft, the engine is expected to afford advantages which include:

- An approximate 10 to 40-hp. boost in speed.
- Reduction of takeoff distance by at least 20 percent, at present gross weight.
- Increase in 504 percent takeoff gross weight (after recent structural revision), with major increase of 1000 in carrying full capacity loads.

Additional qualification tests for approval of an 1800-hp. rating, with wider margins, for the R-2180 are scheduled for completion shortly.

The 1800-hp. version will meet requirements for the DC-4 replacement type of cost with passenger-carrying capacity up to 30. Flat production models of these engines will be for the R-2180 250 mph, two-engine, SA-1600 Scout.

■ **Engine's Background**—CAA approval of the R-2180 encompasses thousands of hours of component and full-scale engine development testing—in the test bed and in the air. The test program has spanned several years.

Evolutionary models of the Two-Way R-2180 on test, in several years before World War II, when Pratt & Whitney built the 2180-in.-displacement

Two-Horse (R-2180) powerplant. During 1936-37, this model was installed in the original Douglas DC-4 and in military prototypes—the Stinson XO and the North American NA 21 aircraft.

■ **Powerplant Switched**—The only DC-4 had a design gross weight of 55,000 lb. During performance testing, its airline sponsor decided that a lighter plane would be desirable and a redesign brought the craft to 50,000-52,000 lb. Because the lighter version did not require the Two-Horse's performance, the R-2000 engine was used.

Before the craft was available for sale, however, the military took it over as the C-54, and had its gross weight increased to the original 55,000 lb. Later, this was boosted to 58,000 lb. Today, the craft's commercial version, with a gross weight of 73,000 lb., is still powered by the same basic R-2180 engine.

Following VJ Day, Pratt & Whitney Aircraft decided these were costs applicable for a modern engine of the Two-Horse's size. Work on an engine of this displacement was renewed, and the R-2180 Two-Way II was developed.

Design Details

The powerplant embodies a combination of features resulting from the extensive development program and proved design resulting from service experience on the company's larger, turbine engines.

■ **New Section**—Popular slab-hp. results replace for optimum strength, and is sculptured from the crankshaft.

Despite, four gear pinions in the reduction pinion chain drive for the dual-speed thrust bearings, main drive service and replacement problems.

Various parts may be mounted on the nose section. An electrical transmission can be installed on the torque-reducer pin, and provisions are made for attachment of reduction boxes, sprockets, alternators, and a collar mount to form engine motor drive connection with the axis of the crankshaft in a vertical position.

The engine case also is approved with manual two-position spark advance for conventional fuel consumption at cruising power.

The external nose oil reservoir pump is fully convertible for operation.

■ **Valve Actuation**—An automatic two-

position valve overlap mechanism is designed to increase the duration limited high power of the engine by 100 deg. with no sacrifice in starting, idling or engine performance. Increased power is the result of improved scavenging residual crankcase gases and counter-act on the cylinder charge.

Low valve overlap is provided for starting, idling and cruising, and high overlap for high power conditions.

Valves valves are actuated by a cam at the front of the power section, intake valves by a cam at the rear of the section.

With a specified engine speed is reached, the valve overlap is automatically changed by moving a "flared" gear in the rear cam planetary system. A helical, crankshaft-driven loader pump supplies oil pressure to hydraulic pistons which rotate the gear to open.

When engine speed becomes less than the specified value, the mechanism automatically returns the "flared" gear to original position.

■ **Case Details**—Tendency of cam lobes and tappet rollers to induce galling or pit has been reduced by decreasing the surface speed of the cams. Although cams have their lobes instead of face and are driven at a crankshaft speed, a reduction in cam diameter provides the low surface speed and contributes to wear savings.

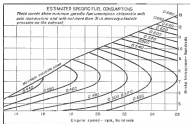
Side thrust of tappets on guides is negligible, forces exerted on both these are reduced by weight and stiffness. As a result, wear on the guides and tappet are reduced, and lobes of the cams are inclined so that lines of action of resultant forces be along and not against axis.

Major reduction in cam loads is obtained by decreasing the rocker arm ratio from 5.5 to 5.4. This 25 percent reduction in loads means deflection in the rocker and tendency at spring back when the cam rises when the top of the cam lobe. Valve pumping is reduced and valve life lengthened.

■ **Crankcase**—Sufficient clearance between cylinders allows enough material for an extra-fine flat crankcase diaphragm section to union rigidity.

Cylinders are secured by bolts extending through the massive flange. This eliminates need for tapered stud bolts and permits the full thickness of the case flange to take crankcase loads.

■ **Crankshaft**—This unit is constructed



of three, piston joined at the crankpins by free pistons and bolts. This permits use of one piston master rods. These are located in adjacent cylinders to induce fast rotation steadily visible.

Crankshaft pistons and crankpins are attached to reduce noise. Bearings are steel sleeves plated with silver-lead in diam. Each link rod has a bronze bushing at its piston pin end, and for greater strength the other end of the rod (subshaft) runs in a silver-plated lead pin.

► **Cylinders**—These are arranged in two rows with rocker boxes free and self-aligning rocker boxes as in the two-row pistons exposed to cooling air. This keeps the valves, guide, and push rod bearing seats at a uniform temperature, and insures of rocker boxes to take a close rub.

Exhaust is taken from a single port in the cylinder top through a short pipe. Buffers prevent exhaust heat from reaching piston boxes.

Sparkplugs are located on each side

of cylinders, when they are equally exposed to the cooling air, so that both plugs will operate at virtually the same temperature.

Rocker box caps may be attached in directly because rocker drive pipes are attached to the lower portion of the lower instead of to the caps.

► **Blower Section**—Impeller drive arrangement characterizes impeller mount and meets in the impeller itself and provides a simple and rugged mechanism.

A steel collar is shrunk over a brass bushing on the fan face of the impeller, and has an integral hub with internal splines to engage splines on the impeller drive shaft. The collar matches the impeller boss and affords a convenient place to remove and for dismantling the assembly. The single speed impeller assembly is guaranteed by the crankshaft through a spring coupling.

Service problems are minimized by cutting the main oil pump directly on

the bottom of the blower case.

Connection attachment points are provided by small pins in each blower outlet boss and by an lugs which may be placed on the front of the blower case for coil support.

► **Carburetor**—The fuel metering unit is separated from the throttle body and is mounted on the side of the engine rear case. Fuel pump is an integral part of the unit. This avoids use of several external fuel lines and connections.

An automatic water regulator and an electrical type fuel pressure transmitter can be mounted on the metering unit.

The air metering unit may be mounted vertically at any place in the induction system where it can sample accurately the charge airflow.

A speed master control provides accurate adjustment of the fuel mixture.

A fuel flow meter may be mounted directly on the fuel case. External connections are unnecessary because of closed passages in the casting.

The intake fuel chamber may be referred to permit operation of the engine in various positions.

► **Accessories Drive**—A new arrangement provides a separate gear box for the accommodation of accessories. These include a starter drive, two generator drives, and two fuel pump drives.

Gear box can be mounted on top or rear of the rear case, or remotely and driven by flexible shaft. An oil pump on the bottom of the gear box provides for lubrication in the getting when it is mounted remotely.

Accessory drive shaft isolates at three times crankshaft speed. A spring-loaded drive gear transmits power from the engine.

► **Ignition**—A low inductance ignition system is incorporated which is designed to afford these advantages: Compactness and easy testing, relative immunity to weather and altitude conditions, reduction of electrical stresses, ability to fire isolated plugs and to maintain flash-over, constant, and electrical loss path lines.

► **Engine Mounting**—This installation is designed to effect a considerable saving in weight.

A mount design is introduced between the blower and the rear case making it an integral part of the engine and providing a positive frame. It is also connected through bearings to each of four vibration isolator bearings to transmit engine torque loads to the structure.

Fire and oil leaks are taken by four lightweight struts, each counteracting the vibration isolator to push on the engine.

Each isolator is quickly attached to the rear case mount structure by a single bolt screwing into a metal boss which is bolted into the rear case.

Basic Needs Outlined For Copter Design

The rapid advance in helicopter airworthiness and development, which has provided definite solutions to some problems decades old and posed new problems unperceivable a few decades back, has created a constantly changing technical field.

Yet old and new problems in the rotary wing field require constant re-evaluation to insure that maximum effect be placed on currently pressing considerations.

W. N. Presley, president, Precision Helicopter Corp., Metrol, Pa., outlined what he considers the current major problems in rotary wing air at a recent meeting of the Helicopter Association of America, and lists them in this order:

► **Following rotor torque**—This problem will not evolve into one particular configuration for many years, and requires efforts of the individual design will remain the determining factor.

Two most widely developed solutions to date are the anti-torque tail rotor turning in a vertical plane and the use of counter-rotating main rotor, mounted on a single axis or laterally or longitudinally opposed.

► **Aerodynamic pitch**—Some type of automatic pitch is desirable to alleviate pilot fatigue now common in long flights in present copters. This consideration may have to wait further improvement in helicopter stability and control.

Major problems in development of an automatic pilot for rotary wing air is the fact that the existing attitude cannot be used in the determining factor to be considered as it is in fixed wing aircraft. The subjective pilot must take the rotor as the input force to the servo-mechanism and this constitutes the heart of the problem.

► **Variable speed transmission**—By permitting "gear shift" between the engine and the rotor, these units would fill the need for greater flexibility between engine power and rotor rotational speed, thereby permitting the application of maximum power over a greater range of altitudes, rotor speeds and operating conditions.

► **Tip stall phenomenon**—Stalling of the rotating blade leads to the forward speed of present helicopters and future improvements in performance hinge largely on the outcome of investigations into this problem.

► **Powerplant**—The wide difference in performance characteristics desired of fixed and rotary wing aircraft indicates that specific design requests for copters should be developed along an entirely different line than present aircraft engines. Some might have already been taken in the design of the engine.

► **Dynamic testing**—Present static tests



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Basic Data—R-2180 Twin Wasp E

| | |
|---|--------------------------------|
| Takeoff power, without water injection with water injection | 1610 hp/2840 rpm/2600 alt. ft. |
| Normal rated power | 1300 hp/2380 rpm/2100 alt. ft. |
| Maximum continuous power | 1400 hp/2800 rpm/2600 alt. ft. |
| Max. stroke | 1400 hp/2770 rpm/2600 alt. ft. |
| Impeller gas rate | 5.75 m |
| Impeller shaft rotation (based from anti-propeller cut) | 6.08 in |
| Impeller shaft spline SAE No. | 0.9775 |
| Overall diameter, maximum | 4.125 in |
| Overall length, maximum | 14.00 in |
| Full gear | 75.48 in |
| Oil consumption maximum & normal rated gas and speed | 306/130 |
| Oil 900 lb/hr and 2100 rpm | 315 lb/hr |
| Dry weight, including standard accessory equipment | 1870 lb |

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of rotor cannot accurately duplicate light conditions and improvements in dynamic test systems, as indicated by the helicopter test tower and the helicopter test rig, are showing increasing usefulness.

Flight testing stress reveals in detail, after examination and other support parts create stress. However, problems, some of which are not yet thoroughly understood because of lack of accurate test methods.

Considerable experience of the scope and accuracy of fatigue has been design data are becoming of increasing importance.

Aloca Prepares for Tapered Sheet Market

American Company of America's decision to install paid-down equipment for rolling lengthwise tapered sheet for aircraft will depend on the economic aspects of the problem.

Even though Aloca feels that aircraft production needs do not now require large scale tapered sheet fabricating facilities, it has been experimenting with the rolling and flattening of tapered sheet for a number of years in anticipation of future models.

The company has set up a mill as an experimental base, and has far ahead some tapered sheet in at least four aircraft manufacturers for evaluation of characteristics.

It has also completed engineering details and estimates required for construction of existing rolling facilities to a production unit for tapered sheet.

In the meantime, the company will accept orders for tapered sheet within the limits that can be manufactured on the present experimental equipment.

British Will Develop Engine for Hoppi-Copter

Development of the Hoppi-Copter, a one-man helicopter, will be continued in England by Hoppi-Copter, Ltd., inventor Horace Proctor revealed on his return to his home in Seattle after a trip to England on invitation of the British Ministry of Supply.

Proctor left in England the two models which he demonstrated for the Ministry. Hoppi-Copter, Ltd., is headed by B. E. Martin of Birmingham as managing director. Martin, member of the Birmingham engine firm of Mervin, Ltd., will work particularly on development of a new engine for the Hoppi-Copter. He will seek to produce a 2-cylinder, four-cylinder engine of 2000 rpm weighing not more than 75 lb.

The engine now used in the Hoppi-Copter has never developed more than 75 hp. It weighs 30 lb.



Navigator crowded quarters (left) in nose-section only necessitate huddled position, small table and little change space for tools.



Control knobs are randomly placed. Working in subzero (seven) his body is cramped and he cannot wear his parachute.



pick-up (right) of bubble blows out. Reading (right) causes awkward reach. Work table is not handy.

Navigators Need More Help and Space

Studies during Arctic mission show poor workplace arrangement and need for more automatic equipment.

An analysis of the activities of an arctic navigator aboard a Boeing B-29 Superfortress on long Arctic missions reveals that poor arrangement of his equipment makes it impossible for him to attain maximum results.

The data also indicate that more automatic devices are needed, greater inherent accuracy is required in present navigation equipment, and that many of the techniques could be greatly simplified.

Richard Crisp—"To eliminate unnecessary weight Air Materiel Command has reduced the number of crew men from approximately 75 percent in bomber designs now being developed (The Cavalier B-54, version 71, the Boeing B-29 version 12, whereas new jet bombers now ask 11).

Weight saving through crew reduction is far greater than the standard 300 lb. per man design allowance. By adding the weight of each equipment the number of crew members the Air Force estimates that each aircraft approach a weight liability of approximately 1500 lb. in its return to base. This situation appears to be a fruitful source of weight saving.

Minors Capt. Powell-Hennessy, crew member cannot be eliminated without

a serious impairment in aircraft operational effectiveness unless their duties can be absorbed efficiently by those remaining. An approach to an estimate of crew activities in crew weight has been suggested by Dr. Paul M. Pitts of the VMC, Aero Medical Laboratories.

The attitude the problem from a maximum point-of-view and represents 10 crew members at 600 man of activity per hr. In an minutes can be eliminated from each job, thus only 540 man at work per hour necessary, thereby permitting elimination of one crew member.

By dividing the 1500 lb. of weight for each crew member by 60, Dr. Pitts derives the fact that 1 man used in crew duty must work 25 lb. of equipment.

This rule of thumb provides a guide for estimating the value of an equipment and the design of crew working space in terms of weight liability.

Arctic Deformation was to answer the questions posed by frequency of equipment operation, amount of time required to obtain desired information, and sequence in which operations were performed that the most serious was required.

The Arctic agent was selected because of the tremendous difficulties there under which the navigator must work.

Northern magnetic, gyro and radio compasses are unreliable under these conditions and usually inaccurate, and for ex-

tended periods the sun has just below the horizon where it is useless for shooting and yet illuminates the sky too much to permit star visibility.

To meet these problems, Air Force investigators examine in the B-29 in the Arctic station two or three navigators and one or two radio operators in the flight cabin. Although this has added the navigation problem for the present, this weight liability could never be reduced in bomb carrying attack is considered.

Although the following findings are based on the Boeing B-29, the general results cannot be confined to that aircraft because they are typical of all war zone bombers. The results are indicative of future requirements and should design on a double basis.

Accommodations—Existing navigation accommodations are too small to permit efficient operation.

Items of equipment are not arranged with adequate ergonomics of their performance and frequency of use.

No space is provided for the extra equipment needed.

An instrument should be installed in the forward section of the cockpit and a hydraulically operated chair should be provided for aiming and lowering the external observer.

A microphone should be provided at the astroline position so that the navigator can direct heading and precision rates without leaving his seat or using the microphone.

A results list control should be provided to allow the navigator to make minor corrections in heading without

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As this work continues, further important developments appear. A few of these, which promise great forward strides in air progress, are discussed on these pages. And Westinghouse will continue to explore new and better methods of solving the problems of aviation.

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A Super-Fine Fuel Atomizer Here's a product of Westinghouse research that solves an old problem in fuel combustion—the ill of imperfect combustion and resultant carbon formation in fuel chambers. It's a new fuel nozzle for atomized gas turbines that provides a spray so fine that superior distribution and greater combustion efficiency are obtained over the entire speed range. This means more power per gallon of fuel, less maintenance and new economy in aircraft operation. The difference between the old and the new is dramatically evident in the photo in this page.



High Temperature Metallurgy Of enormous consequence to gas turbine engines, jet propellers and superchargers are recent Westinghouse developments in high-temperature alloys—Inconel and Duralloy. These are not just two alloys, but a family of metals having high strength at high temperatures. Exact proportioning, precise annealing and careful rolling processes give each metal the qualities required for a particular high-temperature application.

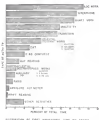
It's a development that paves the way for further advancements in high-temperature jet propellers and gas turbine engines for aircraft.



The Westinghouse Asynclon For greater flight safety of tomorrow's planes . . . Westinghouse has developed experimentally a remarkable new flight control system. It utilizes the same gyroscopic principle as the bank angle indicator . . . also developed by Westinghouse for 50,000 American tanks.

This new Asynclon can be used either to maintain a fixed course and altitude, or measure the plane with a regulated specific velocity in response to figure-by command. The complete control, of which the Gyro-Control Unit (in experimental form at right) is the heart, will weigh between 25 and 50 pounds, depending on the plane in which it is applied. It is not, at present, available commercially.





DISTRIBUTION OF SECOND NAVIGATOR'S TIME ON ARCTIC MISSIONS



DISTRIBUTION OF RADAR OPERATOR'S TIME ON ARCTIC MISSIONS

critical examination of the present logs and the data therein were made with a new level of sophistication, elimination of needless repetition, recording of critical data, and rejection of other data that are never used.

A careful analysis should be made of the log requirements of navigation assigned to various types of operations flying with the aid of designing different logs for different types of missions. The possibility of attempting to design one standard log to serve all theories is as inefficient and wasteful. Navigational products vary too widely from one theater to another.

In addition to the automatic recording of data, the use of an automatic weather and atmospheric and more precise directional gear could conceivably reduce the present Arctic reconnaissance mission requirement for two or three

navigation and two radar operators to only one crew member handling both navigation and radar functions. These devices, while adding only 160 or 180 lb to the airplane, could eliminate as many as three crew members. However, they would have to be carefully designed and early maintained to avoid the security risk engineering additional ground crew maintenance personnel.

Communications Factors: The present microphone system should be replaced by one similar to telephone communications systems. Ambient noise levels in modern aircraft are low enough to make such a system practicable and avoid new transport aircraft features such as a system. First and second navigation and radar operator speed 15, 10 and 8 percent, respectively, of the time on the microphone.

These microphones and headphones become so cumbersome that pilots after a few hours. The many wires usually lie across the navigator's table and become entangled with his other equipment. He has to move microphones and headset microphones before doing any work away from his console area and then often neglects to replace them when he returns to his workplace. Result is that one of the present interphone system often involves pulling the headphones in place looking for the microphone, searching for the microphone switch with hands or feet and stretching to reach some person on a pad box.

Actually in extreme state of flight communications is badly needed most talking, in general, is an inefficient, time-consuming and inaccurate means of transmitting intelligence.

The first navigator spends 15 percent of his time plotting, writing on, and studying his charts. This is evidence of the time spent on map reading (plotting) and plotting aerial lines of position. This time could be decreased by development of more efficient plotting tools and charts.

These three activities—log work, interphone and chart work—plus the time devoted to transition between activities, consume approximately 60 percent of the time available to the first navigator. Another 15 percent is devoted to catalog, writing and miscellaneous activities.

This leaves only 25 percent of the time on 15 man per jet, that the first navigator can devote to the gathering of actual basic atmospheric data such as visual observations, atmospheric observations, drift reading, radio, etc. It is not surprising that the first navigator needs an assistant to perform the majority of his own data for him.

The effect on navigational accuracy of crowded cockpit, awkward movement location and inefficient tools is difficult to assess but its importance cannot be underestimated. These factors increase fatigue and human inefficiency. They require the more extensive study that has been afforded to the quest for pilot preference through simplified cockpit facilities.

Threading in Plastic

Multi-faceted and used to great ends successfully in all plastic materials is made by Hys Pro Tool Co., New Bedford, Mass. Rep's a that unit, used in plastics that are held or held with either cloth or glass fibers, has one specially produced smooth threads at uniform size and assumed their after treatment stage. Design provides for fast ship disposal. Specific modifications in cutting speed, heat, burn developed for each type of plastic to be threaded, and surface treatment assumes lubrication regardless of material.

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Gages Pipe Size

Gages made by Three Point Industries, 1547 North Racine Ave., Chicago 31, Ill., is so calibrated that when placed against piece of pipe or manifold it instantly registers most size by which it is known to trade, and not outside diameter. Unit will measure lines from 4 to 12 in. When closed it measures 24 by 45 in., weighs 2 lb. Rock electric read-out push has etched materials filed with white enamel. Device gives drill size for tapping, and carries inch and metric scale.

Hand Cleaner

For cheap and secure personnel, waterless cleanser with handle to caustic ingredients is made by Safeway Industries, Inc., Pittsburgh 2, Pa. Marketed as "Little Doc" Dryer, material is reported to remove grease, dirt, paint, rubber, cement, shellac, carbon, rosin, dope, bluing compound, etc. without irritating skin.



Small Electric Motor

New, explosion-proof, 1,200 hp. motor with rating of 3,800 to 24,000 rpm under load and 10,000 to 40,000 rpm speed is announced by Mission Electric Mfg. Co., 123 W. Coliseum Blvd., Pontiac, Mich. Weighing less than 11 lb., unit is built to ANM-10A specification and incorporates shrouded bearings for prevention of radio interference, fixed insert ball bearings, and novel binding fasteners. In continuous duty ball-bearing is from 1,200 to 1,100; in intermittent duty, rating is extended from 1,200 to 1,275.



Machine Safety Control

Two-hand-operation electrical device, Moseley, for safe control of trapping mechanism as punch press, cutting machine, shaper, spot welder, and air press, is manufactured by Moseley Switch, Inc., Chicago 18, Ill. Light touch switches from 10 to 18 in., reduce operator's fatigue and makes certain that both hands of the operator are out of the hazard area while machine is in motion. If both switches are not actuated at same time, electrical interlocking controlling trapping mechanism becomes inoperative. Any attempt to do down either of switches or push button on control box has same effect.

For Cleaning jobs

Liquid detergent Deter-Plex for aircraft applications, is marketed by Detrex Corp., Box 501, Detroit 32, Mich. Material is represented to leave no streaks, stains, or harmful effects on fine line, tubes or painted and polished surfaces, and contains no abrasives or harmful alkalis. Most cleaning applications are stated to require only 1/4 to 2 oz. per gallon of water. On smooth and painted surfaces, a pre-rinse with plain water may be used, and while wet, diluted solution is sprayed or flooded on and surface is finished with clean water. For upholstery, a buffer is suggested.

Company's other new product is 2D-Sensor detergent, half-dozen hand-operated steel designed for rapid, safe and thorough cleaning of maintenance metal aircraft parts. Heated by steam gas or

electricity, or by combined gas-oil-fuel or gas-electric heating, air-chase employs stainless-steel-vapor process. Production is continuously rated at 1000 lb. at steel parts per hr., and will accommodate parts that will fit into space 15 by 23 by 12 in. deep. Shifts up to 4 in. in length, are cleaned by impinging them in the vapor zone.

All-Purpose Check Valve

"Leakproof" check valve for oil, oil, gas, water, and other fluid power lines is offered by Kohler Co., Kohler, Wis. Operating pressure is up to 100, 500, 1000, 1500 or 3000 psi as required, and opening can be specified between 0 and 100 psi. Unit is prefabricated at 7500 psi and has temperature range of -85 to 150 F. Sizes are 1, 1 1/2, 2, 3, 4, 6, 8, and 10 in., with inlet pipe, external pipe or tubing connection, or flangeless, butt-welded steel or Monel metal.



Hydraulic Pump Test Stand

Designed for maintenance operator who is handling hydraulic pump; tank aircraft up to and including KC-135 is Model PX-870-CX test stand made by Pacific Aviation Corp., Berkeley, Calif. Pump may be tested to 3000 psi with minimum loading valve set at 3500 psi. Flows to 10 gpm are handled by two flowmeters. 1/4 in. gpm is 4000. Contractor rated up to 15 with an allowable overload of 10 lb. Berthel, temperature, capacity, power input, seal-leakage, and hand-run check can be made on hydraulic pump with test fixture in variable speed drive. Indicate speed variation from 0-6000 rpm can be obtained, and at all speeds pressure and volume readings are easily converted to hp, output for pump under test.

FINANCIAL

Dividend Record MAJOR AIRCRAFT BUILDERS

| | 1948 | 1947 | 1946 | 1945 | 1944 |
|------------------------|--------|--------|--------|--------|--------|
| Boeing | \$3.00 | rel | rel | \$1.00 | \$3.00 |
| Bell | rel | \$1.00 | \$1.00 | 1.00 | 1.00 |
| Boeing | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Cessna | \$1.25 | \$1.25 | \$1.25 | \$1.25 | \$1.25 |
| Consolidated Vultee | rel | 5.00 | 2.00 | 2.00 | 2.00 |
| Curtis-Wright "A" | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Curtis-Wright Common | 2.00 | 0.25 | 0.10 | 0.30 | 0.75 |
| Douglas | \$3.01 | 2.50 | 7.50 | 5.00 | 5.00 |
| Fairchild & A. S. | rel | rel | 0.20 | 0.20 | 0.20 |
| Grumman | 1.00 | 2.50 | 1.00 | 0.75 | 0.75 |
| Lockheed | 1.00 | rel | 1.00 | 2.00 | 2.00 |
| Martin | rel | 0.75 | 1.00 | 1.00 | 1.00 |
| North American | 0.50 | rel | 1.00 | 1.00 | 1.00 |
| Rockwell | 0.25 | 0.25 | 0.25 | 0.50 | 0.50 |
| Rockwell | rel | rel | 0.75 | 0.50 | 0.50 |
| United Aircraft Div. | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| United Aircraft Common | 1.00 | 1.25 | 1.00 | 2.00 | 3.00 |

* Adjusted for 1947 payment stock dividend of June, 1947.
† Dividend not for 1947, 1948.

More Dividends for Stockholders

Stock exchange survey shows increased payments to aircraft company investors, reflecting better times.

A general flow of dividends is coming to stockholders of aircraft companies this year. In large part this is nothing more than a reflection of an improved outlook and the removal of many past uncertainties.

A number of notable cash distributions have been made from past accumulation of earnings and not from current needs. Nevertheless, the most payment of dividends has gone the aircraft industry a more profitable investment than in many quarters.

Survey—An interesting compilation of dividend payments of various nations prepared recently by the New York Stock Exchange placed the aircraft group in a particularly favorable light. The period covered is the nine months ended May, 1948, as compared with a similar period a year ago. Of 36 industrial classifications shown, the aircraft manufacturing group received the largest percentage gain, 208.9 percent.

A total of 16 aircraft companies are included and showed total dividend payments of \$19,141,000 for the current nine-month period as compared with \$5,470,000 for the same period a year ago. In 1947, the company showed an earnings of \$53.25 cents per share. Last year with a deficit of \$5.57 per share, dividend rate was \$3.50.

Another aircraft making dividend distributions from past accumulations at Curtis-Wright Corp. The company reported a net profit of \$2,617,507, after all taxes, for the first six months of the year. Included in this figure, however, was \$608,600 resulting from taxative gain adjustments applicable to 1947. Adjusted, this lower net earnings of \$2,075,560 or about \$2.37 per share on the Class "A" stock and only 15 cents for the common.

Large Post-World War II dividends for 1947 have been made at the rate of \$2 per share on the Class "A" and common stock. The aggregate of such dividend distributions totaled almost \$17 million and will unquestionably bring very large in the industry's distribution to stockholders for 1948.

Little doubt remains that the Curtis-Wright management was forced to make a special \$2 per share payment on the common stock as a result of an adverse attempt to discontinue plans to gain control of the company and declare a special \$7 per share dividend.

Caution—"Defense"—The recent action of the New York Stock Exchange, which has been taken to protect the company's value for its stockholders. The C-W holding as of June 30 was \$14,500,000, and did not include the \$7 per share, according to the company. It is for the most part represented by the entire holdings of the Wright Aircraft Corp. The small holding of the company is being working capital points up the necessary for reducing the firm's excess capitalization. This may appear a cause to call for additional orders of the Class "A" stock as was done last year.

Grumman is unique in the aircraft industry in that it has paid a dividend in every year of its existence, covering a span of 18 years. Further, since a dividend rate has been raised, it has never been put in a subsequent year. With this background, it may be a safe estimate that Grumman will pay another \$1 per share on its present 1.5 million shares of common stock outstanding.

Another—Lockheed was absent from the dividend list during 1947 paid two \$1 stock dividends that for this year. It is safely believed that a similar dividend will be made in 1948 to bring the annual rate up to the previously prevailing \$2.50 level.

With aircraft deliveries expected to remain in the near future, it is logical to expect that 1948 may still be a "boom" year for the industry.

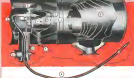
—Sally Alford

MINIMUM MAINTENANCE + MAXIMUM SAFETY Put This Heater in the Nation's Leading Aircraft

South Wind's "121" Aircraft Heater with 300,000 BTU capacity is installed for Boeing, Cessna, Lockheed, Martin and North American aircraft. Easy installation meets minimum maintenance as allowed by the newly simplified maintenance of this "modular" heater. The air-to-air, nonchoking heat exchanger and spark plug can be removed and serviced in minutes! The vented spark plug prevents fouling and insures automatic gap maintenance.

Completely separate combustion and ventilation systems with individual air ducts increase the safety of this compact, lightweight unit. The horizontally "swirl flame" operation in a pressure-type burner. Regulates the air-to-fuel combustion even under widely varying flight conditions. Low stack and metal line pressures at high capacity operation result in highly efficient operation for the "121" in both cold heating and thermal anti-icing applications.

South Wind's "121" is the only 300,000 BTU capacity aircraft heater which meets the rigid CAA life and safety requirements for thermal anti-icing. The "121" also meets Yellow Dot Approved of the U.S. Army Air Force for maintenance. Qualifies. High explosion containment assures inherent heating conditions proves the greater safety and efficiency of South Wind "swirl flame" design. Here, in the back, is why leading maintenance specify South Wind...



1. BURNER HOUSING—All welded—high capacity stainless steel—completely enclosing the combustion system from the venting air system.

2. HEAT EXCHANGER—Horizontally sealed, all welded, stainless steel heat exchanger. Insulating air multiple surfaces and front of South Wind "extreme flame" in maximum contact, high heat transfer efficiency.

3. BURNER HOUSING COVER—Pressure tight but easily removable for quick servicing of burner, orifice and spark plug assembly.

4. FUEL INJECTOR—Pressure type spray nozzle, metered and chokes—pressure for peak combustion efficiency—no external shutoff valves from combustion for duct to eliminate orifice deposits.

5. FUEL LINE—Integral 1/4" stainless steel line and orifice holder assembly—no fittings to freeze or leak—entire assembly isolated from combustion system—disably separated from venting air stream.

6. COMBUSTION AIR INTAKE—No separate combustion air intake completely isolated from venting air stream.

7. FUEL DRAINS—New snap-type drain return complete, easy removal of excess fuel.

8. IGNITION CABLE—Horizontally sealed and shielded to prevent radio interference.

9. BURNER—Jet-type burner with separate vent and ample range of flight conditions without need for adjustment or fuel controls.

10. VENTILATED SPARK PLUG—Dual electrode type with ground electrode attached to spark plug leading to heat exchanger.

11. HEATER CASE—Rugged, hot lightweight stainless steel, for utmost in safety and serviceability—designed at both ends for a quick easy attachment of ducting.

Adaptable to any type Aircraft,

South Wind heaters are designed simply, to solve heating problems in commercial military and civil aircraft. South Wind production facilities can save safety air delivery requirements on heaters from 25,000 to 700,000 BTU capacities. Write today for specific model literature or expert assistance on your aircraft heating problem. South Wind Division, Bernal-Wheeler Corporation, Indianapolis 3, Indiana.

South Wind
AIRCRAFT HEATING
AND THERMAL
ANTI-ICING
EQUIPMENT



No New CAA Changes

CAA's slow moving recognition ground positively as last last week, with no amendments of significant lower echelon changes yet available.

Regional CAA offices submitted proposed changes, usually for local coordination and approval by Administrator John W. Bennett, Director of Washington CAA office, have submitted or soon will submit similar proposals. Civil Service rights of employees who can be transferred or assigned are under consideration. No. 10 is target date for completion of the suggestions.

In Washington Joe Marnett, new director of aviation safety, according to A. S. Koch, and Sam Kemp, director of the new office of aviation development, had arrived to take over their duties. Marnett will focus his area on CAA's administrator at Los Angeles. Kemp has former squad region deputy administrator at Atlanta.

Memorable representatives of Wallace Clark & Co., New York transportation consultant, had started their management survey of CAA in the Washington office. They are expected to examine operational procedures rather than policies or directives of its divisions, both in Washington and in the field, and will make an important report of their findings to Administrator Kestell.

Spreading Heads NYSAC

New York State Aviation Council's elected Ralph H. Springfield, New York University's aviation professor as president, at the council's recent two day conference at Binghamton. He was joined by John W. Van Allen, Buffalo Office officer; John Kendall, Rochester; Stephen Porter, Whitehouse, and Joe W. Cavanaugh, Binghamton, all residents, and John Zentz, New York City, secretary-treasurer.

Plans to establish a paid staff headed by an executive secretary were discussed. Cavanaugh and others were indicating the body could be obtained by the staff period.

The council also adopted a resolution relating to the difficulty which private firm maintenance organizations are facing from the U. S. to Canada.

"Something is there has to pay fees of \$64 after landing," a spokesman for the council said. "Other times he doesn't have to pay anything. It should be as simple as questions in covering the border by car." The resolution is aimed at accomplishing this. Other in progress will be asked to support it.

The council also plans to sponsor a statewide aviation week next year in conjunction with other groups interested in aviation.

BRIEFING FOR DEALERS & DISTRIBUTORS

BONANZA BULLETIN—Aviation Week Editor Robert H. Wood wrote John W. Hirsch, Kinn, the following report on Bonch commercial production and sales design.

Bonch's long-range experimental Bonanza with two 300 hp. Franklin engines, based on the prototype, is to be built next year. The Bonch Twin (Quad) will cost \$100,000 more than stock Bonanza and has no control difference in appearance, despite extra power (75 hp.) and safety factor. First successful flight has been made but the craft is a long way from production and may not be available before 1970. . . . Radio-controlled Bonanza that hit 500 mph. would have been put into higher speed class, officials say, if radio controls would have been it. . . . Recently Bonch is making two Bonanzas a day and about six two-engine Model 16s a month. Through Nov. 8 Bonch had built and delivered 1674 piston Bonanzas and 455 two engine planes. This includes exports.

CHECKOUT ON CESSNA—A (radio report) from Cessna states that since production started 15 months ago, Cessna has built 275 of the Bonanza Model 175 and is now making them at rate of one a day.

Chief pilot by USAF of 12 to 25 of the 39th Air Force received followed next flight in Alaska of a Model 175 by 12 leading back pilots who recommended it to USAF. Skin and flesh are being supplied with the USAF 175 in addition to the wheel gear. . . . Cessna believes production of civilian leading gear installations on two-place Model 175 and 180 and four-place Model 170 is going to be a big market for Bonch. . . . It is the wheel gear that is an optional extra equipment.

Total employment at Wichita and Hutchinson (Kan.) plants is about 10,000. Cessna is making hydraulic parts for farm machinery and turbines for government contracts in addition to planes. Production rate of all planes was up to 31 a day in October, but is cut back for winter.

In a long speech, President Don Wallace and Sales Manager Don Flower are optimistic as small aircraft marketing, but are urgent and for vigorous and continuous effort. . . . Increase in use of airlines for business will sell aircraft travelers on buying their own planes, Flower anticipates. Development of air taxi potential is cramped by CAR regulations requiring two-engine operation on instrument and at night, Flower says.

FOULIE IN FATAL AUTO CRASH—Duane A. Foulie, head of Executive Transport Corp., and owner of Elks Field, Ft. Worth, was fatally injured in a recent auto crash. Widely known as a show and stunt flyer, Foulie was on an A-1C piloted by Walter J. Hays, former company head, on a recent flight. Foulie was killed in a crash landing of his plane.

REDUCED PREMIUMS—In reply to requests, American Wreck has filed a report with Safe Flight Bureau, a group of insurance companies granting reduced rates on premiums on airplanes equipped with the Safe Flight self warning indicator. Companies listed by Safe Flight: Employers Mutual Liability Insurance Co., Wausau, Wis.; Liberty Mutual Insurance Co., Boston; American Insurance Underwriters, Ft. Worth; Mutual Insurance Co., Chicago; American Mutual Liability Insurance Co., Boston. Reductions vary from 24 percent to 5 percent of the premium. The manufacturer has no reports that any of these companies has had to "pay off" on any still in use accident of an airplane equipped with the Safe Flight indicator.

REACTIVATING MILITARY FIELDS—National Association of State Aviation Officials has asked Air Coordinating Committee for study of plans to reactivate military fields now being used for civilian activities, to place transition as quickly as possible. Navy active in reactivating Ops Levee Naval Air Station at Miami without consulting civil aviation agencies is reported to have caused monetary loss and hardship to approximately a dozen small service and school operation at the field. They had used the field only a few months before World War II. . . . Ops Levee is surplus from the Navy. Now they must seek other quarters or close out their businesses.

—ALEXANDER MURKIN

A Killer-Diller is the Octopuller



Cams, bearings, wheels, etc., just don't have a chance unless they're pulled by a pulley made by **Frank Tool Company**. Even the hardest ones come off quickly when you use our pulleys going to work. The more you use as much as a 50-cent pulley, and they really live up to it. They're **pulling** what you **pull** are in **pulling** and you can connect a pulley to another pulley on an axle or off-wheel from one to keep a lot of extra. Your device is sure to have the pulley you want because **pull** you need—we **pull**



Write for catalog to **FRANK TOOL CO.**, 1000 SANTA FE AVE., LOS ANGELES 16, CALIF.

PROTECT YOUR TOOLS
MADE IN U.S.A.
PLUMB TOOL CO.

19470 Tools made by U.S. Pat. 2,610,000

United, Facing Crisis, Asks More Mail Pay

Faced with a continued downward trend in domestic traffic, United Airlines Inc. last week asked again to the Civil Aeronautics Board for an immediate increase in mail pay to cover but a growing financial crisis.

Opening mails for the first nine months of 1945 are now in, and UAL has told CAB its loss about the volume of mail rates established in the Board's big five decrease last spring have been realized. Although the carrier's mail pay was increased from about 45 cents a ton to 57.75 cents (effective in Jan. 1) by the new Board, United inflated a nationwide loss of \$1,937,000 during the first three quarters of 1945 and expects the deficit to grow much higher by year-end.

■ **Face Confusion.** UAL, in its first action, of Sept. 15, asked CAB to raise rates but not given financial detail. Other carriers did not back their traffic seriously, causing confusion.

Balancing traffic growing domestic and international, the CAB is a balancing act against its higher base line, UAL reported that its current income is about 5.69 cents a passenger mile. This is only 2.2 percent more than the level prior to Sept. 1.

If it were established the first-half-week fairly low and domestic service before the end of the year to purchase further and/or domestic of traffic, even the 2.2 percent increase would be eliminated. United's loss is declared. (The carrier submitted its fairly low domestic last week.)

■ **Stock Sale Dismayed.** UAL and sale of 184,889 shares of common stock on Sept. 1 to avoid default on its preferred stock dividends. But it had to offer common at \$20.75 a share against the market price of \$12.67.

Thus, United's loss only temporarily alleviated. United's loss financial condition. Not passed at the rate was \$1,730,755, not enough to meet capital requirements next year.

During the period ended June 30, 1946, United said it will need a raise from \$4,999,000 in additional revenue to meet such requirements of its debt structure and contractual obligations. The carrier has been advised by financial interests that it cannot raise in the immediate future additional capital on its favorable terms by making new capital stock.

■ **More Mail Pay Voted.** United believes increased mail pay is the only remedy for the company's current financial situation. If that is not forthcoming promptly, UAL, it stated, it will be forced to "Deliver on its long-term bond" credit agreement of \$23,000,000, 2

Deliver of the trust indenture relating to its debentures totaling \$12,000,000, according to the default on its bond credit agreement. 5. Inability to pay for acquisition of aircraft on order or other items for which contracts have been made and delivery delayed totaling \$10,571,000 up to July 1, 1946, and which are essential to an adequate going air transport operation."

Last May, soon after CAB's big five rate decision, United filed a petition protesting that the payments provided were almost inadequate and asking for an upward revision. At that time, UAL officials asserted CAB's estimate of the company's traffic and revenue was too optimistic.

■ **CAB Error Alleged.** During the first nine months of 1947, United lost \$20,141,000 revenue passenger miles and CAB assessed a 35.4 percent traffic increase, or 1,071,044,000 revenue passenger miles, in a "deflated" nine-month period. Actually, UAL lost only \$77,454,000 revenue passenger miles in the first three quarters of this year—4.6 percent less than in the same 1947 period.

United officials said that based on an average yield of 5.5 cents a revenue passenger mile, the discrepancy between CAB's forecast and actual results amounts to \$10,647,000. They added that no possible value of traffic in the fourth quarter can correct CAB's error in estimate for 1946.

Instead of the current rate, which United's called 57.75 cents a ton mile, UAL wants temporary mail pay of 57.2 cents a ton mile retroactive to July 1, 1947, or 92.5 cents a ton mile retroactive to Jan. 1, 1946.

Airmail Losses

May Spur Action

Post Office Department estimates a \$50,000,000 deficit on annual payments for the 1945 fiscal year. The 1947 fiscal year record high deficit of \$90,000,000.

Cost reimbursement on 1945 fiscal year postal operations has not yet been completed, but officials seriously are considering a 50 percent increase in airmail service loss. In fiscal 1947 the domestic annual service loss was \$19,000,000, and the foreign annual service loss, \$11,000,000.

■ **Expected Action.** The airmail service loss is expected to spur legislative action.

■ **Postmaster Herbert Hoover's** proposal that the Post Office Department be established as a self-supporting "financing" fund agency, utilizing the Treasury's \$100 million, using its resources to support its operations. The

Department's total estimated loss for the 1948 fiscal year of \$141,000,000 (compared with \$512,000,000 for the 1947 fiscal year) has increased airmail service loss by 50 percent, or at least one down, taxpayer's subvention of the postal service. Several other income sources recommended by Hoover, who now heads the Committee on the Reorganization of the Executive Branch, would reduce postal losses by an estimated \$200,000,000 to \$100,000,000 a year.

■ **Increased congressional support** for additional rate increases for airmail and other long-haul postal services. The airmail rate is scheduled to go from 15 to 18 cents in January. The estimated \$100,000,000 loss on the airmail service is now below the estimated 1948 fiscal year losses on other services: \$150,000,000 for second class mail, \$90,000,000 on third class mail, \$70,000,000 on fourth class mail.

■ **Key points for the proposal** that 45 percent of airmail is transported by air where delivery would be expedited. The first class airmail transported mail service is expected to show a 1948 fiscal year profit of \$10,000,000. The proposal would require carrying a long-haul service and cutting back the Post Office Department's biggest profit operation.

■ **Increased congressional and Post Office Department support** for the proposal to organize "service" and "subsidy" payments to airmail.

Ad Plan May Combat

Airline Traffic Slump

Deeply troubled by the passenger traffic slump during the past year, the certificated domestic airlines are considering an aggressive industry advertising campaign to "sell" air transportation.

The Air Traffic Conference of the Air Transport Association recommended during its recent annual meeting in Washington that the advertising program be established on a long-range basis—with a minimum of three to five years' continuity. Annual expenditures for the ATA campaign would approximate between \$500,000 and \$750,000 and would be in addition to the millions of dollars per year the individual carriers spend on all types of publicity.

■ **Traffic Slump a Factor.** Contributing to the sentiment for a large-scale industry advertising program were new traffic figures showing that during the first three quarters of 1945 revenue passenger mileage flown by the 15 domestic trunk lines was more than 3 percent under the same period last year. In September alone—last month for which statistics are available—passenger traffic dropped



Rusco Aero Rings for Smooth Landings

SPECIFY Rusco Aero Rings to meet the need for landing gear operation on wheels, nose wheels, main wheels, tail wheels, etc. These rings have no joints or weakened spots.

Reduce the impact rate in comparison of wheels of dual landing gear systems. (Referenced in existing literature.) (RUSCO Rings are over 1100 lbs. weight of energy per inch of weight.) — note this has no loss of metal strength.

Rusco Aero Rings are "ladder made" to meet specific requirements. Address us at your nearest representative.

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**CUSTOM
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ADAMS-RITE offers a worthwhile service to the manufacturer who requires a special latching design to meet certain specifications. The creative team at ADAMS-RITE... experienced custom lock engineers and engineering designers... plan and build latching devices that are precisely right to your requirements. Here, under one roof, is everything necessary to the production of such articles... from foundry to plating and all the in-between stages. Names outstanding in industry are on our list of clients and customers. Engineering assistance is your special latching device problem in years for the solving.



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140 WEST CHERRY ROAD, DOWNS, ILLINOIS 6, U.S.A.

Publicity for Air Force Contracts

FOR SOME TIME AVIATION WEEK has heard complaints that the Air Force is not sufficiently publicizing its contracts. The writer last August forwarded a letter to a Dayton Wright Field officer requesting permission for a Dayton representative of this magazine, who would be named at a later date, to inspect lists of all negotiated contracts announced or let. Contract data of this kind is understood to be public property.

So far, we have received no acknowledgment or reply. Data on many bid contracts are already posted and permitted to be published by the Air Force. There is no complaint about these. But hundreds of other bid and negotiated contracts never reach the public eye, and we think they should.

The other day, for example, there was considerable resentment in the textile industry when it became known that the Air Force had accepted bids on one flying suit without throwing the procurement open to competitive bidding, as required by law.

In order to restrict the competition to a few companies, the bidding was handled on a negotiated basis, with only a half dozen firms invited to quote. While the results of negotiated bids are not made public, it is understood that the low bid was about \$105 each. Under open competition, the low bid would have been considerably less, textile people believe. This was the initial procurement of a new model suit, and hundreds of thousands of dollars were involved in the transaction.

A few companies who had learned of this purchasing plan in advance requested permission to bid but were refused we are informed.

The Armed Services Procurement Regulations of May 19, 1948, list the following "circumstances permit negotiation" in lieu of formal advertising:

1. National emergency as declared by the President;
2. Public exigency—where delay or formal advertising would cause the interest of the Government;
3. Purchase not exceeding a thousand dollars;
4. Personal or professional services;
5. Services of educational institutions;
6. Purchases outside the U. S.;
7. Medicines or medical supplies;
8. Supplies purchased for authorized resale;
9. Purchases of maintenance supplies;
10. Impracticable to service competition;
11. Experimental, developmental or research work;
12. Classified purchases (secret or confidential supplies);
13. Technical equipment requiring standardization and interchangeability of parts;
14. Technical or specialized supplies requiring substantial initial investment or extended period of preparation for manufacture;
15. Negotiation following advertising where the prices were deemed unreasonable;
16. Purchase to maintain operation of a facility deemed

essential to industrial mobilization.

17. Otherwise authorized by law.

18. Construction work.

To cite industry people as the flying suit procurement does not fit into any of the categories above. It is not known which of these reasons could have been used as authority for negotiation. The suits were designed and fabricated experimentally by the Aero Medical Laboratory, and complete patterns and specifications were furnished to the bidders. Then, it was a straight production project.

We do not take that dim view of the situation yet, because we feel that an effort to launch the new 78-group program with utmost speed, some contract officers are cutting corners to save time.

However, in making Wright Field officers know well, bids are not made public in negotiated bidding. This is potentially a dangerous situation where public funds are involved. Bidders could well favor the negotiated bidding to advertised bidding. It is much easier to reject a low bidder who is not considered qualified, since he never knows whether he is a low bidder or not. However, many qualified bidders are also excluded by negotiated bidding, and it is a matter of record that advertised bidding always produces lower prices.

Furthermore, Wright Field buyers should not lose sight of the fact that under advertised bidding, there is ample protection for the government against overqualified bids, since the procurement regulations provide that the following points shall be considered:

1. Responsible bidder, financially and otherwise;
2. Judgment, skill and integrity of the bidder;
3. Reputation and experience of the bidder, and price work done by him of similar nature;
4. Possible cost or delay to the Government due to inspection, shipping and location;
5. Advantages or disadvantages to the government resulting from multiple awards.

In spite of the wide latitude given above in making awards under advertised bids, Wright Field buyers may hesitate to use discretion in accepting offers from the low bidder because the bids and the award are made public, and this may interfere trouble in subcontracting a reparation. This is not the case under negotiated bids, because the results are withheld so often from the public.

Negotiated bidding has its place, indeed, such as in procurement of highly technical equipment where there are only a few qualified sources with the required technical knowledge. However, it seems to us that flying suits do not fit into this category.

We hope, as all friends here, that an effort will be made to publish contracts. A disturbing trend has undoubtedly escaped the notice of top officers at Wright Field.

ROBERT H. WOOD

MICRO Precision Switches

have the **precision...**
the **dependability**
the **long life**

that the
aviation
industry can
rely upon

as used in
Sperry A-12 Gyropilots*

*See TM

The VS-1 MICRO precision switch as used in the Sperry A-12 Gyropilot is suitable for use where limited space is available. It is mounted in a plastic case and is light in weight. Terminals are heavy gauge brass with solder 4 screws and lock washers.

D-C Ratings

28 D volts, 4 amperes at 43,000 in. ohms
28 D volts, 10 amperes at 500 ohms
Probable contact life ... 25,000 operations

Selecting a switch to meet existing requirements is made possible with the complete MICRO line. There are 1000 varieties of shapes, sizes, weights, materials and electrical characteristics to meet all the varied requirements of design engineers.

Exact repeatability of operating points . . . long life and dependability are outstanding features.

MICRO engineers are specialists devoted to solving switch problems. Their wide experience is a valuable aid that is at your service upon request.



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GEAR DRIVE



HYGRADE HORIZONTAL
ENCLOSED WORM
GEAR DRIVE



HYPOWER VERTICAL
ENCLOSED WORM
GEAR DRIVE



HYTOP VERTICAL
ENCLOSED WORM
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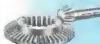
MAXI-POWER
ENCLOSED HELICAL
GEAR DRIVE



SPUR AND
HELICAL GEARS



WORM AND BEVEL
GEARS



SPIRAL BEVEL GEARS
(Ground Tooth)



"A-Q" GEARS
(Aircraft Quality)



ACTUATORS



POWER UNITS

Whatever Your Needs in *POWER TRANSMISSION*

If the equipment you manufacture calls for high quality gears, Foote Bros. has facilities for producing helical, worm, spur, and bevel gears in practically any size and ratio.

If you need high precision gears possessing the advantages of light weight, compactness, extreme efficiency, and lower noise level—capable of transmitting loads at high speed—Foote Bros. "AQ" (Aircraft Quality) gears are the answer.

If you are looking for enclosed gear drives—worm or helical—Foote Bros. has a complete line in a wide

variety of sizes and ratios. The new Hypower Worm Gear Drives and Maxi-Power Helical Gear Drives offer the latest engineering development.

If you require power units or actuators engineered to fit a confined space envelope, and designed to transmit or control power, Foote Bros. engineers will gladly work with you on the development of units to meet your specific requirements.

Foote Bros.' plants offer the latest equipment for producing of gears and enclosed gear drives—backed by almost a century of manufacturing experience.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
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